CLAIMS

1. A method for performing non-destructive measurements of residual stresses in an investigation area of an object by use of optical holographic interferometry technique, in which initially, a hologram of the investigation area of the object is registered and developed on a registering medium, then a small region of the investigation area of the object is subject to a non-destructive dislocation release of the residual stresses, and finally, the registering medium containing the developed holographic image of the investigation area of the object in the initial state and the investigation area of the object containing the region of released residual stresses are simultaneously illuminated with the reference and object beams, respectively, and thus forming an interferogram of the investigation area of the object as a result of interference between the two light waves which corresponds to the light waves scattered off the investigation area of the object before and after release of the residual stresses,
characterized in that
- the light source and registering medium are located in a protected comfortable environment in a distance off the object which is to be investigated,
- that the coherent object light is transported from the light source to the investigation area of the object that is to be investigated by a first single-mode light guidance cable in such a manner that it illuminates the investigation area,
- that the coherent object light which scatters off the investigation area of the object which is to be investigated is collected and transported by a second single-mode light guidance cable from the investigation area to the registering medium in such a manner that it illuminates the registering medium, and
- that the dislocation release of the residual stresses are performed at the object in situ while the formation, registration and development of the holographic image and formation of the interferogram of the investigation area of the object are performed in the comfortable protected location.

2. A method according to claim 1,
characterized in that the formation of the holographic image and interferogram of the investigation area are protected from mutually relative displacements of the object, holographic camera and/or light source by transporting the coherent light between the object, light source, and holographic camera in single-mode light guidance cables, and by ensuring that the endpoints of the single-mode light guidance cables are securely attached in a fixed distance of the investigation area of the object and the recording medium.

3. A method according to claim 1 ~~or 2~~,
characterized in that the non-destructive dislocation release of residual stresses are

performed by exposing the investigation area of the object (7) to an electric high current pulse.

4. A method according to claims ~~1-3~~ Claim 1
characterized in that the registration and development of the holographic image and formation of the interferogram of the investigation area of the object are performed in a location with a protected environment which is suited for operation of amorphous molecular semiconductors.

5. A device for non-destructive real-time measurements of residual stresses by optical holographic interferometry technique which comprises a source of coherent light, a holographic interferometer, a recording medium, a device for dislocation release of residual stresses, and auxiliary devices for observing and processing of the interferograms,
characterized
- in that the holographic interferometer is divided into a holographic probe (1) which contains means for illuminating the investigation area of the object (7) by coherent light, collecting the coherent light that scatters off this investigation area and means for performing a non-destructive dislocation release of the residual stresses in a small region of the investigation area, and a holographic camera (2) which contains means for formation, registration, and development of a hologram and for formation of an interferogram of the investigation area of the object (7), and
- in that the object coherent light is sent from the light source (16) to the probe (1) by single-mode light guidance cable (4), from the holographic probe (1) to the holographic camera (2) by single-mode light guidance cable (5), and the reference coherent light is sent from the light source (16) to the holographic camera (2) in single-mode light guidance cable (6).

6. A device according to claim 5,
characterized in that the holographic probe (1) comprises a spacer portion (30), two rigidly connected optical connectors (8), (9) and electric current supply electrode (10) with means (11) for putting it into junction with the investigation area of object (7), where optical connector (8) is connected to single-mode light guidance cable (4), the optical connector (9) is connected to single-mode light guidance cable, and where the electric current supply electrode is connected to the generator of the high-current electric pulses located in the control unit (3) by means of electric cable (23).

7. A device according to claim 6,
characterized in that the holographic probe (1) is given a narrow cylindrical shape in order to make it suited for use in hardly accessible places and for curved

surfaces on the investigation object (7).

8. A device according to claim 6 ~~or 7~~,
characterized in that the holographic camera (2) comprises two optical connectors (13), (14) and a recording medium (15) which are rigidly connected and arranged at fixed distances relative to each other, where optical connector (13) is connected to single-mode light guidance cable (5), and optical connector (14) is connected to single-mode light guidance cable (6).

9. A device according to claim 8,
characterized in that single-mode light guidance cables (4) and (6) are connected to the source of coherent light (16) via the splitter of coherent light (18) and the optical connector (2).